

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A rebreather apparatus of the radial-type, comprising:
 - means for providing breathable gasses to a user of the apparatus and transporting gases exhaled by the user to a medium for removing unwanted elemental molecules from the exhaled gases;
 - means for providing compressed gases to the apparatus;
 - means for monitoring the gases circulating through the apparatus and controlling the addition of compressed gas to the apparatus;
 - a gas scrubber canister having at least one removable end cap and a cross sectional shape through a plane that is perpendicular to the longitudinal axis of the canister selected from the group of shapes consisting of an oval and an ellipse ~~to provide a gas scrubber canister having a lower for profile on a diver's body;~~
 - the at least one removable end ~~[[caps]]~~ cap being located ~~[[one]]~~ at ~~[[each]]~~ an end of the gas scrubber canister;
 - the at least one end cap configured for watertight attachment to the gas scrubber canister;
 - the gas scrubber canister configured for securing a disposable adsorbent material, used to remove unwanted elemental molecules from the exhaled gases, in the interior thereof;
 - the gas scrubber canister having a generally hollow interior tube located in the approximate center thereof, the tube having the same cross sectional shape through a plane that is perpendicular to the longitudinal axis of the tube as the gas scrubber canister and configured to allow gases to pass radially through the walls of the tube;
 - the gas scrubber canister being further configured such that when the adsorbent material is placed in the gas scrubber canister, there is a generally uniform space between the

canister wall and the adsorbent material throughout the portion of the canister containing the adsorbent material such that gases will pass radially through the adsorbent material between the hollow tube and the space between the canister wall and the adsorbent material; and

the apparatus further comprising a means for securing the apparatus to the body of a user of the apparatus.

2. (Original) The apparatus of claim 1 wherein the at least one removable end cap is configured for placing a gas monitoring and control system therein.

3. (Original) The apparatus of claim 2 wherein the at least one removable end cap is two end caps such that the scrubber canister has two removable end caps.

4. (Original) The apparatus of claim 3 wherein both removable end caps have a gas monitoring and control system inserted therein.

5. (Currently amended) A rebreather apparatus of the radial-type, comprising:
a gas supply circuit having a mouthpiece, an inhalation portion, an exhalation portion and at least one counterlung;
the inhalation portion and the exhalation portion each having at least one gas conduit;

the mouthpiece being connected to the inhalation portion and the exhalation portion and configured to allow inhalation of gases from the inhalation portion and exhalation of gases into the exhalation portion;

a source of compressed gas;

the source of compressed gas being in communication with the gas supply circuit by at least one compressed gas conduit;

at least one control system for monitoring the gases circulating through the gas supply circuit and controlling the addition of compressed gas into the gas supply circuit;

a gas scrubber canister having at least one removable end cap;

a removable insert secured in the interior thereof such that there is a generally uniform space between the wall of the canister and the insert, and having a cross sectional shape through a plane that is perpendicular to the longitudinal axis of the insert selected from the group of shapes consisting of an oval and an ellipse ~~to provide a gas scrubber canister having lower profile on the diver's body;~~

the at least one removable end cap being located ~~[[one]]~~ at ~~[[each]]~~ an end of the gas scrubber canister;

the at least one removable end cap configured for ~~water-tight~~ watertight attachment to the gas scrubber canister and connection to the gas supply circuit via the gas conduits of the inhalation portion and the exhalation portion of the gas supply circuit;

the insert configured for holding a disposable adsorbent material used to remove unwanted elemental molecules from the gas supply conduit;

the insert having a generally hollow tube in the approximate center thereof and a plurality of holes therethrough to allow gases to pass through the insert and the ~~gas-scrubbing medium~~ adsorbent material;

the insert further configured such that when the insert is secured in the gas scrubber canister and filled with an adsorbent material and the at least one removable end cap is placed on the gas scrubber canister and connected to the gas supply circuit, gases will pass radially through the insert and adsorbent material between the hollow tube and the space between the canister wall and the insert;

~~the insert, and the hollow tube having the same cross sectional shape through a plane that is perpendicular to the longitudinal axis of the tube as the gas scrubber canister insert;~~
and

the apparatus further comprising a harness for securing the apparatus to the body of a person using the apparatus.

6. (Original) The apparatus of claim 5 wherein the at least one removable end cap is configured for placing a gas monitoring and control system therein.

7. (Original) The apparatus of claim 6 wherein the at least one removable end cap is two end caps such that the scrubber canister has two removable end caps.

8. (Original) The apparatus of claim 7 wherein both removable end caps have a gas monitoring and control system inserted therein.

9. (Currently amended) The apparatus of claim 5 wherein the apparatus is configured such that the gas scrubber canister is adapted to be worn on the back of a diver's back ~~diver's~~ diver's body.

10. (Currently amended) The apparatus of claim 9 wherein the long axis of the canister is adapted to be worn parallel with the long axis of the ~~diver's~~ diver's body.

11. (Currently amended) The apparatus of claim 5 wherein the apparatus is configured such that the gas scrubber canister is adapted to be worn on the front of a diver's ~~diver's~~ diver's body.

12. (Currently amended) A rebreather apparatus of the radial-type, comprising:

a gas supply circuit having a mouthpiece, an inhalation portion, an exhalation portion and at least one counterlung;

a source of compressed gas that is in communication with the gas supply circuit through at least one compressed gas conduit;

at least one control system for monitoring the gases circulating through the gas supply circuit and controlling the addition of compressed gas into the gas supply circuit;

a gas scrubber canister having a pair of removable end caps, a removable insert secured in the interior thereof such that there is a generally uniform space between the wall of the canister and the insert, and a cross sectional shape through a plane that is perpendicular to the longitudinal axis of the canister selected from the group of shapes consisting of an oval and an ellipse ~~to provide a gas scrubber canister having a lower profile on the diver's body;~~

the pair of removable end caps being located one at each end of the gas scrubber canister;

each end cap configured for ~~water-tight~~ watertight attachment of the gas scrubber canister and connection to the gas supply circuit via the gas conduits of the inhalation portion and the exhalation portion of the gas supply circuit;

each end cap being further configured such that the at least one automatic control system can be housed therein and the at least one compressed gas conduit can be connected thereto;

the insert configured for holding a disposable adsorbent material used to remove unwanted elemental molecules from the gas supply conduit;

the insert having a generally hollow tube in the approximate center thereof and a plurality of holes therethrough to allow gases to pass through the insert and the adsorbent material;

the insert further configured such that when the insert is secured in the gas scrubber canister and filled with an adsorbent material, and the end caps are placed on the gas scrubber canister and connected to the gas supply circuit, gases will pass radially through the insert and adsorbent material between the hollow tube and the space between the canister wall and the insert;

the insert[[,]] and the hollow tube having the same cross sectional shape through a plane that is perpendicular to the longitudinal axis of the tube as the gas scrubber canister; and

the apparatus further comprising a means for securing the apparatus to the body of a person using the apparatus.

13. (Original) The apparatus of claim 12 wherein removable end caps are configured for placing a gas monitoring and control system therein.

14. (Original) The apparatus of claim 13 wherein at least one of the removable end caps has a gas monitoring and control system inserted therein.

15. (Currently amended) The apparatus of claim 12 wherein the ends caps have two flexible O-rings disposed thereon such that each O-ring creates an individual seal between the end caps and the scrubber canister, and the two O-rings create a ~~water-tight~~ watertight seal between the end caps and the scrubber canister.

16. (Currently amended) The apparatus of claim 12 wherein the apparatus can be easily reconfigured such that the position that the gas scrubber canister and the compressed gas source are worn on the diver's body can be changed.

17. (New) A rebreather apparatus of the radial-type, comprising:

(a) at least one tank for providing compressed breathing gases to the apparatus;

(b) an inhalation conduit for delivering breathing gases to a user;

(c) an exhalation conduit for receiving exhalation gases from the user; and

(d) a gas scrubber including:

(i) a canister having an outer wall with a cross sectional shape through a plane that is perpendicular to the longitudinal axis of the canister selected from the group of shapes consisting of substantially oval and substantially elliptical;

(ii) an inlet to the canister;

(iii) an interior tube disposed within the canister, wherein the interior tube has a cross sectional shape through a plane that is perpendicular to the longitudinal axis of the interior tube substantially similar to the cross sectional shape of the canister;

(iv) a scrubbing material disposed within the canister in surrounding relationship with the interior tube, wherein exhalation gases travel in a substantially radial direction through the scrubbing material; and

(v) an outlet from the canister.

18. (New) The apparatus of claim 17 wherein the scrubbing material is spaced from the outer wall.

19. (New) The apparatus of claim 17 wherein the inlet is configured such that gases are received along the inner surface of the outer wall.

20. (New) The apparatus of claim 17 wherein exhalation gases travel from the inner surface of the outer wall, through the scrubbing material, and into the interior tube.

21. (New) The apparatus of claim 17 wherein the inlet is configured such that gases are received in the inner tube.

22. (New) The apparatus of claim 17 wherein exhalation gases travel from the inner tube, through the scrubbing material, and to the inner surface of the outer wall.

23. (New) A gas scrubber for a rebreather apparatus of the radial-type, the gas scrubber comprising:

(a) a canister having an outer wall with a cross sectional shape through a plane that is perpendicular to the longitudinal axis of the canister selected from the group of shapes consisting of substantially oval and substantially elliptical;

(b) an inlet to the canister;

(c) an interior tube disposed within the canister, wherein the interior tube has a cross sectional shape through a plane that is perpendicular to the longitudinal axis of the interior tube selected from the group of shapes consisting of substantially oval and substantially elliptical;

(d) a scrubbing material disposed within the canister in surrounding relationship with the interior tube, wherein exhalation gases travel through the scrubbing material in a substantially radial direction; and

(e) an outlet from the canister.

24. (New) The gas scrubber of claim 23 wherein the scrubbing material is spaced from the outer wall.

25. (New) The gas scrubber of claim 23 wherein the inlet is configured such that gases are received along the inner surface of the outer wall.

26. (New) The gas scrubber of claim 23 wherein exhalation gases travel from the inner surface of the outer wall, through the scrubbing material, and into the interior tube.

27. (New) The gas scrubber of Claim 23, wherein the inlet is configured such that gases are received in the inner tube.

28. (New) The gas scrubber of claim 23 wherein exhalation gases travel from the inner tube, through the scrubbing material, and to the inner surface of the outer wall.